

CORRECTED VERSION

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
22 January 2004 (22.01.2004)

PCT

(10) International Publication Number
WO 2004/008259 A1

(51) International Patent Classification⁷: **G04B 17/06**,
17/22, F16F 1/366

(21) International Application Number:
PCT/GB2003/003000

(22) International Filing Date: 10 July 2003 (10.07.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
02/08802 12 July 2002 (12.07.2002) FR

(71) Applicant and

(72) Inventor: LEVINGSTON, Gideon [GB/FR]; 50, avenue
Francis de Croisset, F-06130 Grasse (FR).

(74) Agents: CALDERBANK, T., Roger et al.; Mewburn El-
lis, York House, 23 Kingsway, London, Greater London
WC2B 6HP (GB).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,

GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,
SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

(48) Date of publication of this corrected version:

8 April 2004

(15) Information about Correction:

see PCT Gazette No. 15/2004 of 8 April 2004, Section II

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: MECHANICAL OSCILLATOR SYSTEM

(57) Abstract: A mechanical oscillator system comprising a balance wheel and a spiral or helicoidal balance spring for use in horological mechanisms or other precision instruments. The balance spring is made of a non-magnetic composite, polymer, carbon or ceramic material, preferably a composite material of carbon fibres in a polymer, carbon or ceramic matrix, and the balance wheel is made from a non-magnetic ceramic. The values of the thermal expansion coefficients for the balance spring and balance wheel are similar, very small and stable over a wide temperature range. The expansion coefficients in the axial sense of the spring and of the balance wheel are of opposite sign and they compensate one another. The density of these materials is smaller than that of the currently used metals. Through this combination of materials it is possible to obtain significant advantages and a higher level of accuracy and stability compared with metal oscillator systems.



WO 2004/008259 A1

BEST AVAILABLE COPY